U. S. NUCLEAR REGULATORY COMMISSION

REGION II

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Licensee:	Carolina Power & Light Company (CP&L)
Facility:	H. B. Robinson Unit 2
Location:	3581 West Entrance Road Hartsville, SC 29550
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EXECUTIVE SUMMARY

H. B. Robinson Power Plant, Unit 2
NRC Inspection Report 50-261/97-11

This inspection included a review of the licensee's implementation of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants" [the Maintenance Rule]. The report covers a one-week period of inspection.

- Overall, the inspection team concluded that the licensee had a comprehensive Maintenance Rule program that met the requirements of 10 CFR 50.65, and the program was being effectively implemented.

Operations

- Licensed operators had a good understanding of the Maintenance Rule, understood how to use the matrix for taking equipment out-of-service, and understood their responsibilities for implementing the Maintenance Rule. (Section O4.1)

Maintenance

- In general, required structures, systems, and components (SSCs) were included within the scope of the Maintenance Rule. (Section M1.1)
- A violation was identified for failure to include the switchyard relay building and the turbine exhaust hood spray system within the scope of the Maintenance Rule. (Section M1.1)
- The licensee's plans for performing periodic evaluations and assessments met the requirements of the Maintenance Rule. (Section M1.3)
- The licensee's method for balancing reliability and unavailability was satisfactory and met the intent of paragraph (a)(3) of the Maintenance Rule. (Section M1.4)
- Procedural instructions to the system engineers for how to collect and track unavailability time were considered weak. (Section M1.4)
- The licensee considered safety in establishment of goals and monitoring for the (a)(1) systems and components reviewed. (Section M1.6)
- Corrective actions, goals, and monitoring were very detailed and comprehensive for all (a)(1) SSCs reviewed. (Section M1.6)
- In general, operating data was being properly captured, and industry-wide operating experience was considered, as appropriate. (Section M1.6)
- A violation was identified for failure to identify an unavailability period for two (a)(1) Maintenance Rule components. (Section M1.6)

- For (a)(2) SSCs, in general, detailed performance criteria had been properly established, suitable trending had been performed, and corrective actions were taken when SSCs failed to meet performance criteria or experienced failures. The overall detailed program, specifically monitoring at the function level, was considered a strength. (Section M1.7)

- Industry-wide operating experience had been considered, where practical, and operating data had been properly captured. However, a weakness was identified in the licensee's program in the area of collecting and tracking unavailability for safety significant SSCs. (Section M1.7)

- In general, plant material condition and housekeeping observed during walkdowns was excellent. Preservation of equipment by painting was considered to be good. The licensee initiated corrective actions for the minor discrepant conditions noted in the structural area. The overall excellent housekeeping and material condition was considered a strength. (Section M2.1)

- Assessments of the Maintenance Rule were very good and provided effective monitoring of implementation of the Maintenance Rule. Audit personnel demonstrated good knowledge of Maintenance Rule requirements. (Section M7.1)

Engineering

- The overall quantitative approach used to perform risk ranking for SSCs in the scope of the Maintenance Rule was good. Performance criteria were established with substantial probabilistic risk assessment (PRA) input. Documentation of PRA input was good. (Section M1.2)

- The method of assuring the assumptions for reliability and availability in the PRA are conserved was good. (Section M1.2)

- The expert panel committee meeting discussions on covered topics were good, and the expert panel meeting minutes were well documented. (Section M1.2)

- The approach to risk-ranking for the Maintenance Rule was adequate. (Section M1.2)

- The approach, under paragraph (a)(3) of the Maintenance Rule, to assessing the risk-impact of maintenance activities was good. The assignment and use of licensed operators in the planning process and to perform evaluations of planned configurations was a strength. (Section M1.5)

- The use of the Equipment Out-Of-Service (EOOS) monitor to evaluate plant configurations was good. The licensee's process for ensuring that critical safety functions were available during planned outages was adequate. (Section M1.5)

- The overall approach to assessing the risk-impact of maintenance activities was considered adequate. (Section M1.5)

- System engineer's knowledge of their systems and the Maintenance Rule was excellent. They understood how to apply the Maintenance Rule to their systems and were proactive in taking corrective actions. The system engineering area was considered a strength. (Section E4.1)

Report Details

Summary of Plant Status

Robinson operated at power during the inspection period.

Introduction

The primary focus of this inspection was to verify that the licensee had implemented a maintenance monitoring program which met the requirements of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," (the Maintenance Rule). The inspection was performed by a team of inspectors that included a Team Leader, three Region II inspectors, one Region II Senior Reactor Analyst, one Resident Inspector, and a one Reactor Operations Engineer from the Quality Assurance and Maintenance Branch, Office of Nuclear Reactor Regulation (NRR). In addition, NRC staff support was provided by the Reactor Operations Engineer from NRR. The licensee provided an overview presentation of the program to the team on the first day of the inspection.

I. OPERATIONS

04 Operator Knowledge and Performance

04.1 Operator Knowledge of Maintenance Rule

a. Inspection Scope (62706)

Prior to the onsite portion of the inspection, the team reviewed six months of operation's shift logs. During the onsite portion of the inspection, the team interviewed six licensed operators involved in on-shift operations and work coordination duties to determine if they understood the general requirements of the Maintenance Rule and their particular duties and responsibilities for its implementation. Two were currently involved in senior reactor operator (SRO) duties, two SROs were performing work control activities, and two were performing reactor operator (RO) duties. From the interviews the team determined their understanding of the Maintenance Rule, how their current duties were impacted by the Maintenance Rule, and their understanding of how availability was tracked by the Maintenance Rule.

b. Observations and Findings

In general, the operators interviewed understood the philosophy of the Maintenance Rule and their responsibilities associated with the Maintenance Rule. The operators all believed that they were adequately trained and understood the requirements of the applicable procedures. All operators understood the need to restore equipment to operating condition and minimize SSC unavailabilities. The interviews indicated that the operations staff was sensitive to the importance of the logs as a source of information for Maintenance Rule record keeping.

The operations staff used the online safety matrix to understand the risk significance of planned activities. Operations sent

representatives to participate in the planning meetings. The individuals interviewed had an understanding of the common risk terms used at the site. The operations staff knew who to contact for aid in evaluating risk due to emergent equipment problems while other equipment was out-of-service. All SROs were asked to use the matrix to demonstrate a plant configuration and its implications for risk. All were very familiar with the matrix. All were aware of the EOOS computer program being used for risk evaluations.

The team's review of six months of control room logs from both units showed good detail in the logs for equipment operability and activities start and stop times. The site used availability as defined in Procedure ADM-NGGC-0101, Maintenance Rule Program. This definition differed from the NUMARC definition, but it was well defined and was understood by the individuals interviewed. Procedure OMM-007, Equipment Inoperable Record, was used to determine equipment logging requirements. Prior to the inspection, the Maintenance Rule Engineer had performed a check to ensure all items for which availability data was required was currently required for tracking in OMM-007. Only one omission was identified by the licensee. The team checked a sample of required systems and found them to be included in OMM-007, Revision 40.

c. Conclusions

Licensed operators had a good understanding of the Maintenance Rule, understood how to use the matrix for taking equipment out-of-service, and understood their responsibilities for implementing the Maintenance Rule.

II. MAINTENANCE

M1 Conduct of Maintenance

M1.1 Scope of Structures, Systems, and Components Included Within the Rule

a. Inspection Scope (62706)

Prior to the onsite inspection, the team reviewed the H. B. Robinson Final Safety Analysis Report (FSAR), Licensee Event Reports (LERs), the Emergency Operating Procedures (EOPs), previous NRC Inspection Reports, and information provided by the licensee. The team selected an independent sample of structures, systems, and components that the team believed should be included within the scope of the Maintenance Rule, which was not classified as such by the licensee. During the onsite portion of the inspection, the team used this list to determine if the licensee had adequately identified the structures, systems, and components that should be included in the scope of the Maintenance Rule in accordance with 10 CFR 50.65(b).

b. Observations and Findings

The licensee appointed an expert panel to perform several Maintenance Rule implementation functions including establishing the scope of the Maintenance Rule. The panel reviewed 144 systems and structures for H. B. Robinson of which 81 were determined to be in the scope of the Maintenance Rule.

The team reviewed the licensee's Maintenance Rule database in an effort to verify that all required SSCs were included within the scope of the Maintenance Rule. The team's review was performed to assure the scoping process included the following:

- all safety-related SSCs that are relied upon to remain functional during and following design basis events and ensure the integrity of the reactor coolant pressure boundary, the capability to shut down the reactor and maintain it in a safe shutdown condition, and the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposure comparable to the 10 CFR, Part 100 guidelines,

- non-safety related SSCs that are relied upon to mitigate accidents or transients,

- non-safety related SSCs which are used in the plant emergency operating procedures,

- non-safety related SSCs whose failure could prevent safety-related SSCs from fulfilling their safety-related function, and

- non-safety related SSCs whose failure could cause a reactor trip or actuation of a safety-related system.

The team reviewed the licensee's database and verified that all required SSCs were included in the Maintenance Rule with the exception of the following.

- The licensee had not included the switchyard relay building (Building 175) in the scope of the Maintenance Rule. The switchyard and transformer system (System 5120) included various components associated with the offsite 115 KV and 230 KV electrical power distribution networks and had been included in the scope of the Maintenance Rule because failure of these SSCs could potentially cause a reactor trip. Review of components located in this structure determined that many protective relays included in System 5120 were located in this building. The failure of the structure could cause failure of those protective relays leading to a reactor trip. This is contrary to 10 CFR 50.65, which requires inclusion of non-safety related SSCs whose failure could cause a reactor scram or actuation of a safety-related system. The licensee issued Condition Report (CR) No. 97-02214 during the inspection to re-evaluate this structure for inclusion in the Maintenance Rule.

- The licensee had not included the turbine exhaust hood spray system (System 5030) in the scope of the Maintenance Rule. 10 CFR 50.65 requires inclusion of non-safety related SSCs whose failure could cause a reactor scram or actuation of a safety-related system. The team discussed this discrepancy with members of licensee management, and the team was informed that this system should have been included in the scope of the Maintenance Rule. The licensee issued CR No. 97-02216 during the inspection to re-evaluate this system for inclusion in the Maintenance Rule.

The team verified that the switchyard relay building and the turbine exhaust hood spray system were added to the licensee's Maintenance Rule database as within the scope of the Maintenance Rule prior to exiting the site. The licensee's determination that these SSCs should be included within the scope of the Maintenance Rule was documented in the meeting minutes for the licensee's expert panel meeting conducted on November 5, 1997.

10 CFR 50.65(b) establishes the scoping criteria for selection of safety-related and non-safety related SSCs to be included within the Maintenance Rule program. Scoping criteria includes non-safety related SSCs whose failure could cause a reactor scram or actuation of a safety-related system. Failure to include the switchyard relay building and the turbine exhaust hood spray system in the scope of the Maintenance Rule is in violation of 10 CFR 50.65(b) and are identified as two examples of violation 50-261/97-11-01, Failure to Include All Required Structures, Systems, and Components in the Scope of the Maintenance Rule.

c. Conclusions

In general, required SSCs were included within the scope of the licensee's program. A violation was identified for failure to include the switchyard relay building and the turbine exhaust hood spray system within the scope of the Maintenance Rule.

M1.2 Safety or Risk Determination

a. Inspection Scope (62706)

Paragraph (a)(1) of the Maintenance Rule requires that performance monitoring and goals be commensurate with safety. Implementation of the Maintenance Rule using the guidance contained in NUMARC 93-01 requires that safety be taken into account when setting performance criteria and monitoring under paragraph (a)(2) of the Maintenance Rule. This safety consideration would then be used to determine if SSC functions were to be monitored at the train, system, or plant level. Also, Section 9.3.2 of NUMARC 93-01, recommends that risk-significant SSC performance criteria be set to assure that the availability and reliability assumptions used in the risk-determining analysis (i.e., PRA) were maintained. The team reviewed the licensee's methods for making these required safety determinations.

b. Observations and Findings

The team reviewed documentation associated with determining risk ranking and performance criteria for the Maintenance Rule. The team also attended an expert panel meeting, and interviewed some of its members.

b.1 Risk Ranking

The licensee's PRA model used for the current ranking process was that of the individual plant evaluation (IPE) submitted to the NRC, dated August 1992, updated to reflect plant changes incorporated through refueling outage 17. The model was a full scope, Level 2 analysis for internal events and loss of offsite power, that used generic data and plant specific data gathered from 1985 through 1995 as the basis for its initiating event frequencies and for its availability and reliability data. The original PRA was developed using the cutset and fault tree analysis (CAFTA) set of PRA codes and had a core damage frequency (CDF) of 3.2 E-4. The updated model has a CDF of 4.9 E-5. Differences in the CDFs are explained by changes in the modeling due to plant changes, procedure changes, or changes to assumptions, and the update of initiating event frequencies and equipment data to incorporate the new data through 1995. The licensee used this updated model for the risk rankings used in the Maintenance Rule, development of the site's equipment out-of-service risk matrix and for the basis of equipment out-of-service evaluations used in planning equipment out-of-service schedules.

The team reviewed the truncation limits used during the risk ranking process. Truncation limits were imposed on PRA models in order to limit the size and complexity of the results to a manageable level. Robinson used a truncation level of 5 E-9 when quantifying their PRA for use for Maintenance Rule applications or when running EOOS evaluations. This was four orders of magnitude less than the internal event core damage frequency. The team reviewed a June 4, 1997 analysis, transmitted by letter NF-97A-0166, to determine the sensitivity of the PRA results to truncation levels. Based on the review, the truncation level used appeared to be appropriate for use to perform the risk ranking for the Maintenance Rule.

The team reviewed a sample of SSCs covered by the Maintenance Rule that had been categorized as non-risk significant to assess if the licensee had adequately established the safety significance of those SSCs. The team reviewed an analysis titled "Identification of Risk Significant Systems within Maintenance Rule Scope", Revision 2, dated July 31, 1997. The licensee used risk achievement worth (RAW), risk reduction worth (RRW) and percent contribution to CDF or large early release frequency (LERF) as criteria for ranking the systems. The numerical risk ranking given in the PRA analysis supported the decisions made by the licensee's expert panel.

Based on this review, it appeared that the licensee's process was adequate to perform the risk ranking for the Maintenance Rule.

b.2 Performance Criteria

The team reviewed the licensee's performance criteria to determine if the licensee had adequately set performance criteria under (a)(2) of the Maintenance Rule consistent with the assumptions used to establish the safety significance. Section 9.3.2 of NUMARC 93-01 recommends that risk significant SSC performance criteria be set to assure that the availability and reliability assumptions used in the risk determining analysis (i.e. PRA) are maintained.

Based on interviews, the team determined the original first estimates for performance goals were determined with input from the engineers responsible for the specific equipment. The estimates were reviewed by the expert panel, and forwarded to the PRA specialists for review. Recommended changes were sent back to the expert panel for approval. The team reviewed an analysis titled "PSA Evaluation of Maintenance Rule Performance Criteria", transmitted by memo NF-97A-0307, dated October 31, 1997. The analysis was a sensitivity study to determine the impact of the Maintenance Rule criteria on CDF. Individual systems or groups of components were evaluated to determine impact on CDF and LERF, and then all assumptions were evaluated together to measure the change in CDF. The licensee emphasized the value of checking groups and systems at their assumed Maintenance Rule criteria, and they recognized the limiting calculation with all systems set at their maximum was not a normal use of PRA. The analysis results were very well documented.

b.3 Expert Panel

The team reviewed the licensee's process and procedures for the expert panel. The licensee had established an expert panel in accordance with the guidance provided in NUMARC 93-01. The expert panel's responsibilities included the authority for decisions regarding Maintenance Rule scope, risk-significance, performance criteria selection, changing the classification of systems from (a)(2) to (a)(1), and making recommendations for changing (a)(1) systems to (a)(2). The expert panel had representation that included operations, maintenance, work control, Probabilistic Safety Assessment (PSA), regulatory affairs, and engineering. The team reviewed the qualifications of the expert panel and found the panel had a great deal of plant and industry experience, and technical training. A review of the meeting minutes of meetings conducted since January 1997, showed the minutes were well detailed, with good explanations for the basis of panel decisions.

Members of the team attended an expert panel meeting conducted November 5, 1997. Issues discussed were scoping issues raised by the NRC inspection team. The team noted a good discussion of the issues raised.

c. Conclusions

The overall quantitative approach used to perform risk ranking for SSCs in the scope of the Maintenance Rule was good. Performance criteria

were established with substantial PRA input. Documentation of PRA input was good. The current method of assuring the assumptions for reliability and availability in the PRA are conserved was good. The expert panel committee meeting discussions on covered topics were good, and the expert panel meeting minutes were well documented. Based on the review of the sampled SSCs, the licensee's approach to risk-ranking for the Maintenance Rule was adequate.

M1.3 Periodic Evaluation

a. Inspection Scope (62706)

Paragraph (a)(3) of the Maintenance Rule required that performance and condition monitoring activities and associated goals and preventive maintenance activities be evaluated taking into account, where practical, industry-wide operating experience. This evaluation was required to be performed at least one time during each refueling cycle, not to exceed 24 months between evaluations. The team reviewed the licensee's periodic evaluation process.

b. Observations and Findings

At the time of this inspection, the licensee was not required to have completed the first periodic evaluation. The licensee has performed seven audits in the area of 10 CFR 50.65 which are discussed further in paragraph M7.1 below.

The licensee planned to have a Periodic Maintenance Assessment covering the period January 1, 1995, to November 15, 1997, completed by December 10, 1997. This assessment would cover all of Fuel Cycle 17 and a portion of Fuel Cycle 18.

c. Conclusions

The licensee's plans for performing periodic evaluations and assessments met the requirements of the Maintenance Rule.

M1.4 Balancing Reliability and Unavailability

a. Inspection Scope (62706)

Paragraph (a)(3) of the Maintenance Rule required that adjustments be made where necessary to ensure that the objective of preventing failures of SSCs through (preventive) maintenance was appropriately balanced against the objective of minimizing unavailability of SSCs due to monitoring or preventive maintenance. The team reviewed the licensee's approach to balancing system reliability and unavailability for risk-significant systems to achieve an optimum condition.

b. Observations and Findings

Requirements for balancing reliability and unavailability were contained in CP&L's Administrative Procedure ADM-NGGC-0101, Maintenance Rule Program, Revision 7. The licensee's approach to balancing reliability and unavailability consisted of monitoring SCC performance against the established performance criteria. The performance criteria for the SCCs were established based in part on a sensitivity study which compared the PSA assumptions to the performance criteria. This information was used to develop optimum SCC reliability and unavailability requirements relative to core damage.

The licensee assigned responsibility to system engineering personnel to evaluate the balancing of reliability and unavailability each time a functional failure occured or excessive unavailability due to maintenance was identified. Specifically, the engineers were required to assess the adequacy and frequency of preventive maintenance tasks when reliability performance criteria were exceeded and to determine if excessive preventive maintenance activities were scheduled or if planned maintenance activities had excessive duration if unavailability criteria were exceeded. In addition to the event based monitoring approach for balancing, the licensee performed a higher level summary assessment every refueling cycle (less than 24 months) to review the effectiveness of the balancing.

The requirements were contained in Paragraph 9.12.5 of Procedure ADM-NGGC-0101, which stated, "Balancing of availability and reliability is evaluated by analyzing system performance criteria each time an event (e.g., a functional failure, failure to perform on demand) is identified. Review the implementation of this activity for effectiveness." Performance criteria monitoring requirements were specified in Paragraph 9.8 of Procedure ADM-NGGC-0101 and Paragraphs 8.2 and 8.4 of site Procedure TMM-040, Revision 5, System and Component Trending Program. Based on discussions with system engineers and review of trending data for the systems reviewed in Sections M1.6 and M1.7, the team questioned whether procedural guidance was adequate to give system engineers proper instructions on tracking unavailability time due to excessive preventive, predictive or corrective maintenance. There was minimal procedural guidance on where unavailability data was to be obtained and how it was to be counted. The licensee stated that the procedure would be enhanced to provide additional guidance on collecting and tracking unavailability time.

c. Conclusions

The licensee's method for balancing reliability and unavailability was satisfactory and met the intent of paragraph (a)(3) of the Maintenance Rule. However, procedural instructions to the system engineers for how to collect and track unavailability time were considered weak.

M1.5 Plant Safety Assessments Before Taking Equipment Out-of-Service

a. Inspection Scope (62706)

Paragraph (a)(3) of the Maintenance Rule states that the total impact on plant safety be taken into account before taking equipment out-of-service for monitoring or preventive maintenance. The team reviewed the licensee's procedures and discussed the process with plant operators and work control.

b. Observations and Findings

The team interviewed the Work Control Supervisor, the Work Week Manager, the Work Control Center SRO, and members of the operations on shift in the control room, all of whom performed the evaluations for equipment out-of-service using the risk matrix. The matrix was a tool for assessing permissible combinations of taking two major functions out-of-service. The matrix was developed using risk measures available through the PSA analysis. For combinations of more than two functions, a computerized PRA tool (a full power EOOS model) was used by the site's risk analyst to evaluate risk for full power plant configurations. EOOS had the CAFTA plant model loaded into it, and was set to fully recalculate the model at a 5E-9 truncation. The model was a Level 2 PRA, and LERF and RAW values could be generated for each plant condition evaluated. The output was used to plan future equipment outages, to evaluate the plan of the day, and to evaluate the impact of equipment failures on plant conditions.

The Work Control Supervisor and the Work Week Managers were SROs on shift prior to moving to work control. The team attended a plan of the day meeting and reviewed the site's plan of the week. There was good interchange of information and coordination of activities demonstrated at the meeting. The plant operations experience present in the planning process was seen as a strength. The team had trial plant configurations represented on the plant matrix by various individuals in the planning process. All demonstrated a good knowledge of the use and limitations of the matrix. The team had the site PSA specialist analyze various trial plant configurations using EOOS. The specialist had very good knowledge of EOOS and of the Maintenance Rule. The use of EOOS for determining the risk input for plant equipment out-of-service evaluations was good.

The team interviewed the Manager of Outage and Planning about assessment prior to removing SSCs from service during transition periods and during shutdown (Modes 5, 6 and defueled). Robinson currently does not have a way to assess transition risk. Outage removal from service decisions has been made in accordance with Procedure PLP-055, Outage Risk Management, Revision 14, dated October 2, 1996. The procedure was deterministic in approach and has limitations based on other equipment

out-of-service, defense in depth, and maintaining the systems to meet critical functions. A shutdown EOOS model was being evaluated. The team found the current guidelines to be adequate.

c. Conclusions

The approach, under paragraph (a)(3) of the Maintenance Rule, to assessing the risk-impact to maintenance activities was good. The assignment and use of licensed operators in the planning process and to perform evaluations of planned configurations was a strength. The use of the EOOS monitor to evaluate plant configurations was good. The process for ensuring that critical safety functions were available during planned outages was adequate. The overall approach to assessing the risk-impact of maintenance activities was considered adequate.

M1.6 Goal Setting and Monitoring for (a)(1) SSCs

a. Inspection Scope (62706)

Paragraph (a)(1) of the Maintenance Rule required, in part, that licensees shall monitor the performance or condition of SSCs against licensee-established goals, in a manner sufficient to provide reasonable assurance the SSCs are capable of fulfilling their intended functions. The Maintenance Rule further required that goals be established commensurate with safety and that industry-wide operating experience be taken into account, where practical. Also, when the performance or condition of the SSC did not meet established goals, appropriate corrective action was to be taken.

The team reviewed the systems and components listed below which the licensee had established goals for monitoring of performance to provide reasonable assurance the system or components were capable of fulfilling their intended function. The team verified that industry-wide operating experience was considered, where practical, that appropriate monitoring was being performed, and that corrective action was taken when SSCs failed to meet goal(s) or when a SSC experienced a Maintenance Preventable Function Failure (MPFF).

The team reviewed program documents and records for four systems or components that the licensee had placed in the (a)(1) category in order to evaluate this area. The team also discussed the program with licensee management, the Maintenance Rule Engineer, system engineers, and other licensee personnel.

b. Observations and Findings

b.1 Instrument Air (IA) - System 6135

In December 1995, based on a historical review, the IA system was classified as (a)(1) due to the unavailability of the "C" and primary air compressors, and excessive moisture causing air operated valve problems. An extensive preventive maintenance (PM) program was

initiated for air compressors and dryers, resulting in significant work throughout 1996. These PMs resulted in increased reliability for the air compressors and dryers and increased confidence from operations personnel. The replacement of the "C" air compressor and dryer, with an Atlas-Copco rotary compressor and dryer, has virtually eliminated the moisture problems.

The team reviewed the corrective action for these failures and the goals and monitoring under the (a)(1) status, and concluded that the corrective action, goals and monitoring were appropriate. The team also reviewed additional work order data concerning performance of this system for the period June 1995 to the beginning of the inspection.

The team compared periods of unavailability identified by a review of the clearance report log and the unit logs with the unavailability database for the IA system. The team noted an unavailable period of 13 hours and 49 minutes for the "A" and "B" air compressors, which occurred on June 3, 1997, documented in clearance No. 9700384, and a period of 36 minutes of unavailability for the primary air compressor, which occurred on June 27, 1997, documented in clearance report No. 9700478. These unavailability periods were not included in the Maintenance Rule database. The licensee documented this failure to identify unavailability periods for Maintenance Rule components in CR No. 97-02229. This failure to capture unavailability time was considered a violation of 10 CFR 50.65(a)(1) for failure to monitor the performance or condition of an (a)(1) system and is identified as Violation 50-261/97-11-02, Failure to Effectively Monitor the Performance or Condition of the Instrument Air System.

b.2 Chemical and Volume Control System (CVCS) - System 2060

The reactor coolant system (RCS) pressure boundary function of the CVCS on Unit 2 had been classified as (a)(1) since December 15, 1995. Repeated valve failures resulted in failure to maintain the RCS pressure boundary function within its performance criteria. These failures were also considered an unacceptably high contributor to charging pump unavailability. The team verified that the licensee had considered previous operating experience when taking corrective actions and had implemented goal setting and monitoring as required by paragraph (a)(1) of the Maintenance Rule for the CVCS system. Although some corrective actions taken on the CVCS were predictive, discussions with the system engineer revealed that CP&L's Maintenance Rule Program Procedure No. ADM-NGGC-0101, Revision 7, did not specify that monitoring of SCCs in (a)(1) should be predictive when appropriate. Paragraph 9.4.2 of NUMARC 93-01, Revision 2, states that monitoring should be predictive in order to provide timely warning. The Maintenance Rule Engineer stated that Procedure ADM-NGGC-0101 would be revised to clearly indicate that monitoring of (a)(1) SSCs should be predictive when appropriate.

b.3 Main Steam System - System 3020

The team reviewed a sample of CRs, maintenance history, tag out and unit logs, and system scoping documentation for the main steam system.

The licensee identified eight different functions within the scope of the Maintenance Rule for the main steam system and established appropriate reliability performance criteria for risk significant normally operating functions. In addition, reliability and unavailability performance criteria for standby functions such as the main steam supply to the AFW turbine were established. The team considered these performance criteria to be appropriate.

The steam generator (SG) power operated relief valve (PORV) setpoint control function of the main steam system had been moved to the (a)(1) category due to eighteen functional failures. The failures were associated with a set point drift problem on all three current/pneumatic (I/P) controllers for the SG PORVs. The licensee initially established a reliability performance criterion of 3 functional failures per cycle for the SG PORV setpoint controllers; however, at the time of the inspection, the I/P controllers were being recalibrated every two weeks to keep the controllers within 30 psi of their lift setpoint of 1110 psi. Licensee CR Nos. 97-01540, 97-01951 and 97-02014 had been initiated for Fisher Model 546 I/P controllers used in the main steam system as well as other systems within the plant. The CRs identified drift problems with newly installed I/P controllers as well as wear and age problems associated with in-use I/P controllers. The licensee was changing the calibration frequency for the Fisher Model 546 I/P controllers and evaluating replacement with a more reliable I/P controller. In addition, Operations checks the PORV controllers on a daily basis to verify that the controllers are within the 30 psi lift setpoint boundary established for the SG PORVs. The team found the licensee's corrective actions to maintain the SG PORV setpoint control function were acceptable; however, a permanent design change appears to be necessary to improve I/P controller performance.

The team also noted that the steam dump valves (SDVs) have experienced 4 functional failures in the last cycle compared with a reliability performance criterion of 1 functional failure per cycle. The team reviewed CR No. 97-02110 which identified problems with steam dump controllers and solenoid valves. The licensee's corrective action to improve SDV reliability included recalibrating the controllers and replacing defective solenoid valves. At the time of the inspection, the licensee was still evaluating whether the SDVs should be moved to category (a)(1) of the Maintenance Rule and goals established. The team concluded that the licensee was taking actions to address steam dump valve performance; however, corrective actions were still ongoing at the time of the inspection.

In addition to review of the above specific problems and corrective actions, the team walked down accessible portions of the system and found that material condition was good. The team noted slight leakage

passed one safety relief valve (SRV) seat, but this did not affect SRV operability. The team found that the system engineer was very knowledgeable of his system and Maintenance Rule requirements for his system and concluded that he was aggressive in pursuing main steam system performance issues needed to improve the performance and reliability of this system.

b.4 125 VDC Distribution and Batteries - System 5235

System 5235 included safety-related and non-safety related balance of plant (BOP) 125 VDC batteries, chargers, and DC electrical distribution. The licensee had classified the safety-related portions of this system as high safety significant. The safety-related battery chargers had been classified as (a)(1) on July 18, 1995 due to reliability problems. Problems had included aging components and repetitive functional failures on the older A and B battery chargers. Although the newer, redundant A1 and B1 battery chargers were more reliable, all safety-related battery chargers had been included within the (a)(1) classification. The licensee has replaced aged capacitors and silicon controlled rectifiers (SCRs), implemented vendor recommendations to operating procedures, and made various improvements to the existing preventative maintenance program. The licensee had established goals of no more than two functional failures per rolling 15 month period for the older A and B chargers combined, and no more than one functional failure per rolling 18 month period for the newer A1 and B1 chargers combined. The licensee goals were to remain in effect until May 3, 1998, when the licensee was scheduled to consider the battery chargers for classification as (a)(2). The Team verified that the licensee had implemented goal setting and monitoring as required by paragraph (a)(1) of the Maintenance Rule for the 125 VDC distribution and batteries system.

c. Conclusion

The licensee considered safety in establishment of goals and monitoring for the (a)(1) systems and components reviewed. Also, corrective actions, goals, and monitoring were very detailed and comprehensive for all SSCs reviewed. In general, operating data were being properly captured, and industry-wide operating experience was considered, as appropriate. However, a violation was identified for failure to identify unavailability periods for two Maintenance Rule components.

M1.7 Preventive Maintenance and Trending for (a)(2) SSCs

a. Inspection Scope (62706)

Paragraph (a)(2) of the Maintenance Rule states that monitoring as required in paragraph (a)(1) is not required where it has been demonstrated that the performance or condition of an SSC is being effectively controlled through the performance of appropriate preventive maintenance, such that the SSC remains capable of performing its intended function.

The team reviewed selected SSCs listed below for which the licensee had established performance criteria and was trending performance to verify that appropriate preventive maintenance was being performed, such that the SSCs remained capable of performing their intended function. The team verified that industry-wide operating experience was considered, where practical, that appropriate trending was being performed, that safety was considered when performance criteria were established, and that corrective action was taken when SSCs failed to meet performance criteria, or when a SSC experienced a MPFF.

The team reviewed program documents and records for selected SSCs the licensee had placed in the (a)(2) category in order to evaluate this area. The team also discussed the program with licensee management, the Maintenance Rule coordinator, engineering and maintenance personnel, and other licensee personnel.

b. Observations and Findings

b.1 Structures

The licensee had completed their baseline inspection which was conducted and documented in accordance with Procedure EGR-NGGR-0351, "Condition Monitoring of Structures", Revision 5. The licensee used the Law Project No 30720-5-0126, "Independent Consultant Inspection Cooling Lake Dam and Ash Pond Dike H. B. Robinson Steam Electric Plant Hartsville, South Carolina", dated December 4, 1995, as the baseline inspection for embankment, spillway, and intake and discharge structures. The team reviewed Procedure EGR-NGGR-0351, to evaluate the adequacy of the acceptance criteria and performance criteria for evaluation of concrete and structural steel.

The team conducted a walkdown inspection of the intake structure, the dam, the turbine building, and portions of the reactor auxiliary building, and the discharge structure, in order to observe the condition of the concrete and steel structures located within and without the buildings. Although some minor surface cracking in the concrete walls was observed, the team concluded from the visual observations that the buildings appeared structurally sound. No unacceptable conditions were noted. The team identified some minor material condition deficiencies discussed further in Section M2.1. During the walkdown inspection, the team was accompanied by civil engineers who were knowledgeable and qualified to perform structural evaluations.

b.2 Component Cooling Water (CCW) - System 4080

Review of Maintenance Rule activities for the CCW system determined that appropriate performance criteria had been established and monitoring was being accomplished against those criteria. Review of the problems associated with the system indicated that appropriate corrective actions had been taken for failures. Operating experience was being used in

system monitoring. The team compared periods of unavailability identified by a review of operator logs and clearance logs with the unavailability data base for the CCW system.

b.3 Auxiliary Feedwater System (AFW) - System 3065

Review of the AFW system revealed that appropriate performance criteria had been established for each of the AFW performance monitoring functions. Work orders and corrective actions for CRs for the previous 24 month period were reviewed and found to be satisfactory. Operating experience was utilized in determining corrective actions taken by the licensee. The team compared unavailability times taken from clearance logs with current Maintenance Rule trend data and found that the times from the logs had been captured in the Maintenance Rule data. However, during review of operator logs, the team found that unavailability times of 4.5 hours for the turbine driven AFW pump and 5 hours for the motor driven AFW pump, which occurred on July 1 and July 22, 1997, respectively, were not entered into the unavailability database until the end of October or early November, 1997. The system engineer was aware of the unavailability events and had entered them into his INPO unavailability tracking database but delayed entering the times into the Maintenance Rule database. The additional unavailability did not cause the pumps to exceed their performance criteria. The team considered this delay in entering unavailability times into the Maintenance Rule database, the lack of procedural instructions for the system engineers (Section M1.4 above) and the violation for failure to capture all unavailability time for the IA system (Section M1.6 1.b above) to indicate weaknesses in the licensee's program in the area of collecting and tracking unavailability for safety significant SSCs.

b.4 Feedwater System (FW) - System 3050

Review of the FW system revealed that appropriate performance criteria had been established for each of the FW performance monitoring functions. Work orders and condition reports for the previous 24 month period were reviewed and found to be satisfactory. Operating experience was utilized in determining corrective actions taken by the licensee. No deficiencies were identified during inspection and review of this system.

b.5 Emergency Diesel Generators (EDGs)- System 5095

The team reviewed CRs, maintenance history, tag out and unit logs, and system scoping documentation.

The licensee had identified one function under the scope of the Maintenance Rule for each of two EDGs. In addition, one function for EDG Regulatory Guide (RG) 1.97 instrumentation had been identified. An unavailability performance criterion of 1.5% (i.e., 198 hours per cycle) and a reliability performance criterion of 2 functional failures had been established for each EDG. In addition, the licensee established a

reliability performance criterion of 3 functional failures for the RG 1.97 instrumentation. The team considered these performance criteria to be appropriate.

The team noted that the licensee experienced 51.2 hours of unavailability on the A EDG and 204.1 hours of unavailability on the B EDG within the past eighteen months. The 204.1 hours exceeded the unavailability performance criterion of 198 hours for the B EDG. However, 95 hours of the 204.1 occurred on August 16, 1997, because of a functional failure of the B EDG due to an operator mispositioning the output breaker switch. Since the output breaker would not have remained closed and the EDG would not have functioned had it received a load demand, the error was counted as a valid load demand functional failure event. The licensee did not consider the overall unavailability performance due to maintenance or equipment failures to be a problem since 95 hours of time was due to operator error. The team concluded that the licensee was effectively monitoring and maintaining the EDGs under (a)(2) of the Maintenance Rule.

Also, the licensee had initiated CR 97-02202 which identified that EDG RG 1.97 instrumentation had experienced 5 functional failures within the past eighteen months. At the time of the inspection, the licensee was considering moving EDG RG 1.97 instrumentation to (a)(1) of the Maintenance Rule or re-evaluating the reliability performance criterion limit for EDG RG 1.97 instrumentation since they are low safety significant components. The licensee plans to complete corrective action by November 18, 1997. The team found that the licensee was taking appropriate corrective action to address this issue.

The team walked down the A EDG, which was out-of-service for planned preventive maintenance, and found no material condition issues. The system engineer was very knowledgeable of the EDGs and EDG subsystems and was very familiar with EDG monitoring requirements used to implement both the Maintenance Rule and the station blackout Rule.

b.6 Dedicated Shutdown Diesel Generator (DSDG) - System 5098

For the DSDG, the licensee had established an unavailability performance criterion of 2% per cycle or 264 hours and a reliability performance criterion of two functional failures per cycle. In the last 18 months, the DSDG had experienced 357 hours of unavailability and one functional failure event. The team questioned the licensee's justification for not monitoring the DSDG under the (a)(1) monitoring category of the Maintenance Rule since its unavailability time exceeded its performance criterion. The licensee stated that they did not consider moving the DSDG to the (a)(1) category since the 347 hours of unavailability included 140 hours between August 25 - 31, 1997, for a planned six year vendor recommended maintenance overhaul. In addition, site specific operating experience and the PSA assumed a DSDG unavailability of 3.42% per cycle. At the time of the inspection, the licensee was addressing this unavailability issue through a draft CR and was evaluating whether the unavailability performance criterion should be raised to a higher

value (i.e., 3 to 3.5% unavailability per cycle). Before the unavailability performance criterion is raised, it must be approved by the licensee's expert panel. The team considered the licensee's corrective action to address this issue and justification for monitoring the DSDG under 50.65(a)(2) appropriate.

The team walked down the DSDG and found the material condition to be very good. The system engineer was very knowledgeable of the DSDG and DSDG subsystems and was very familiar with DSDG monitoring requirements used to implement both the Maintenance Rule and the station blackout Rule.

b.7 Radiation Monitoring - System 7005

The team reviewed portions of System 7005, process and area radiation monitoring, during this inspection. The team noted that the licensee had replaced most of the original radiation monitors with newer, digital equipment, which was more reliable. Review of System 7005 determined that appropriate performance criteria had been established, and monitoring had been accomplished against those criteria. Review of the problems associated with the system determined that appropriate corrective actions had been taken for failures. Operating experience had been used in system monitoring.

b.8 Auxiliary Building Heating, Ventilation, and Air Conditioning (HVAC) System - System 8210

The team reviewed selected portions of System 8210 including HVAC equipment supporting the SI pump room, AFW pump room, and the RHR pump room. The team determined that appropriate performance criteria had been established and monitoring had been accomplished against those criteria. Review of the problems associated with the system determined that appropriate corrective actions had been taken for failures. Operating experience was being used in system monitoring. No deficiencies were noted during inspection and review this system.

c. Conclusions

For (a)(2) SSCs, in general, detailed performance criteria had been properly established; suitable trending had been performed, and corrective actions were taken when SSCs failed to meet performance criteria or experienced failures. The overall detailed program, specifically monitoring at the function level, was considered a strength. Industry-wide operating experience had been considered, where practical, and operating data had been properly captured. However, a weakness was identified in the licensee's program in the area of collecting and tracking unavailability for safety significant SSCs.

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Material Condition Walkdowns

a. Inspection Scope (62706)

During the course of the reviews, the team performed walkdowns of selected portions of the following systems and plant areas, and observed the material condition of these SSCs.

- Instrument Air System (6135)
- Component Cooling Water System (4080)
- Turbine Building
- Main Dam
- Discharge Structure
- Reactor Auxiliary Building
- Intake Structure
- Auxiliary Building HVAC System - System 8210
- DC Distribution and Batteries - System 5235
- Radiation Monitoring - System 7005
- Auxiliary Feedwater - System 3065
- Feedwater - System 3050
- Chemical Volume and Control - System 2060
- Main Steam - System 3020
- Emergency Diesel Generators - System 5095
- Dedicated Shutdown Diesel Generator - System 5098
- Other Balance of Plant Areas

b. Observations and Findings

Housekeeping in the general areas around equipment was excellent. Piping and components were painted, and very few indications of corrosion, oil leaks, or water leaks were evident. Two exceptions were noted: (1) housekeeping in the pipe alley was not consistent with the excellent housekeeping noted for the rest of the plant, and (2) boric acid residue needed to be cleaned from conduits, piping, wall and floor behind the boric acid storage tank (Deficiency 97D01365 issued).

The team conducted the walkdowns accompanied by the responsible system engineer. In general, the engineers demonstrated a good level of knowledge and familiarity with their assigned system. During the walkdown inspection of structures, the team noted the following minor conditions.

- Standing water in the service water pits at the intake structure.
- A crack in the concrete extending from the west manhole at the dam.
- Erosion in the dam embankment near the rip rap, and several small trees growing in the rip rap.

- Missing grout under a platform base plate at the intake structure.
- Spalled concrete adjacent to steel imbeds in 5 locations in the pipe alley.

Although the above structural items were not noted in the 1996 Structures Baseline inspection, it could not be determined whether the structural discrepancies existed at the time of the 1996 inspection. All conditions were considered minor and immediate actions were initiated to document the conditions and take appropriate corrective actions .

c. Conclusions

In general, plant material condition and housekeeping observed during walkdowns was excellent. Preservation of equipment by painting was considered to be good. The licensee initiated corrective actions for the minor discrepant conditions noted in the structural area. The overall excellent housekeeping and material condition was considered a strength.

M7 **Quality Assurance in Maintenance Activities**

M7.1 Licensee Self-Assessments

a. Inspection Scope (62706)

The team reviewed the licensee's self-assessments to determine if Maintenance Rule independent evaluations had been conducted and the findings of the audits had been addressed.

b. Observations and Findings

The following self-assessments were reviewed:

- Robinson Nuclear Plant and Nuclear Assurance Section Assessment No. R-ES-95-01, "Maintenance Rule Provisional Implementation", dated July 24 - August 2, 1995.
- Performance Evaluation Section Assessment No.96-08-MA-C, "Maintenance Rule Pre-implementation Assessment," dated May 24, 1996.
- Self Assessment No. 97-03, Maintenance Rule Implementation," dated January 6-9, 1997.
- Nuclear Assessment Section Assessment No. R-CA-97-01, "Corrective Action," dated August 26, 1997.
- Chief Engineer Section Assessment CES-97-016, "Summary Review of Maintenance Rule Implementation At RPN," dated October 14, 1997.

- CP&L Memorandum to T.D. Walt, Manager, Performance Evaluation Section from C.E. Robinson, Subject: Maintenance Rule, dated May 5, 1997.

- CP&L Memorandum to T.D. Walt, Manager, Performance Evaluation Section from J. Fletcher, Subject: Analysis of PES Maintenance Rule Assessment Ability to Predict Performance on NRC Inspection, dated May 29, 1997.

In general, the quality of the audits was very good. The assessments were detailed, addressed Maintenance Rule requirements and related items, identified a number of findings, and made recommendations for improvement of the program. Personnel who conducted the assessments demonstrated exceptional understanding of the elements and underlying principals of the Maintenance Rule. Corrective actions for assessment findings were appropriately implemented. The team considered Assessment R-ES-95-01 to be excellent and its findings and recommendations set the standard for the implementation of an effective Maintenance Rule program.

During review of assessments and discussions with the Maintenance Rule Engineer, the team noted that Revision 7 of Maintenance Rule Program Procedure ADM-NGGC-0101 did not specify review of MPFFs to determine if equipment failures were repetitive for similar components within a system or for similar components across system boundaries. The Maintenance Rule Engineer stated that, although not specified in the procedure, he was responsible for performing the review of MPFFs for repetitiveness (within a system or across system boundaries). He further stated, and the team verified, that the requirement for review of MPFFs to determine repetitiveness had been included in Revision 5 to procedure ADM-NGGC-0101, but deleted in a later revision. It was not clear why the requirement had been deleted, but there was no evidence that the repetitiveness reviews were not being performed. The Maintenance Engineer stated that ADM-NGGC-0101 would be revised to require a review of MPFFs for repetitiveness (within a system and across system boundaries).

c. Conclusions

Assessments of the Maintenance Rule were very good and provided effective monitoring of implementation of the Maintenance Rule. Audit personnel demonstrated good knowledge of Maintenance Rule requirements.

III. ENGINEERING

E2 Engineering Support of Facilities and Equipment

E2.1 Review of Updated Final Safety Analysis Report (UFSAR) Commitments (62706)

A recent discovery of a licensee operating their facility in a manner contrary to the UFSAR description highlighted the need for a special,

focused review that compares plant practices, procedures and parameters to the UFSAR descriptions. While performing the inspections discussed in this report, the team reviewed the applicable portions of the Robinson UFSAR that related to the areas inspected. The team verified that the UFSAR wording was consistent with the observed plant practices, procedures and parameters.

E4 Engineering Staff Knowledge and Performance

E4.1 Engineering Knowledge of the Maintenance Rule

a. Inspection Scope (62706)

The team interviewed licensee system owners (system engineers) of the SSCs reviewed in paragraphs M1.6 and M1.7 to assess their understanding of the Maintenance Rule and associated responsibilities.

b. Observations and Findings

System engineers knowledge of their systems was excellent and their understanding of the Maintenance Rule was very good. Most system engineer had owned their system for many years. However, even system engineers with less than a year's experience on their system were extremely knowledgeable of their systems and the Maintenance Rule requirements.

c. Conclusions

System engineer's knowledge of their systems and the Maintenance Rule was excellent. They understood how to apply the Maintenance Rule to their systems and were proactive in taking corrective actions. The system engineering area was considered a strength.

V. MANAGEMENT MEETINGS

X1 Exit Meeting Summary

The Team Leader discussed the progress of the inspection with licensee representatives on a daily basis and presented the results to members of licensee management and staff at the conclusion of the inspection on November 7, 1997. The licensee acknowledged the findings presented.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

T. Bardauskas, Maintenance Rule Engineer
J. Boska, Manager, Operations
P. Cafarella, Superintendent of Special Projects
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T. Wilkerson, Manager, Regulatory Affairs

NRC

B. Mallett, Acting Deputy Regional Administrator, RII
J. Zeiler, Resident Inspector

LIST OF INSPECTION PROCEDURES USED

IP 62706	Maintenance Rule
IP 62002	Inspection of Structures, Passive Components, and Civil Engineering Features a Nuclear Power Plants

ITEMS OPENED, CLOSED, AND DISCUSSED

OPENED

Type	Item Number	Status	Description and Reference
VIO	50-261/97-11-01	Open	Failure to Include All Required Structures, Systems, and Components in the Scope of the Maintenance Rule (Section M1.1).
VIO	50-261/97-11-02	Open	Failure to Effectively Monitor the Performance or Condition of the Instrument Air System (Section M1.6 b.1).

PARTIAL LIST OF DOCUMENTS REVIEWED

Procedure ADM-NGGC-0101, Revisions 4, 5, and 7, Maintenance Rule Program

Procedure EGR-NGGC-0351, Revision 5, Condition Monitoring of Structures

Procedure EGR-NGGC-0010, Revision 2, System & Component Trending Program and System Libraries

Procedure TMM-040, Revision 5, System and Component Trending Program System Notebook, Auxiliary Building System No 8320

Procedure PLP-055, Revision 14, Outage Risk Management

Procedure OMM-007, Revision 40, Equipment Inoperable Record

Procedure OMM-048, Revision 2, Work Coordination & Safety Assessment

H. B Robinson Unit 2 Steam Electric Plant Probabilistic Safety Assessment Summary Document approved August 18, 1997

H. B. Robinson Unit 2 power Plant Identification of Risk Significant Systems Within Maintenance Rule Scope, Revision 2

CP&L Memo Serial NF-95A-0671 dated September 7, 1995, Subject - Uncertainty Analysis of H. B. Robinson Damage Frequency

CP&L Memo Serial NF-97A-0307 dated October 31, 1997, Subject - PSA Evaluation of Maintenance Rule performance Criteria

CP&L Memo Serial NF-97A-0166 dated June 6, 1997, Subject - Truncation Analysis For The H. B. Robinson PSA Model

System Notebook, Turbine Building System No 8205

System Notebook, CW/SW Intake Structure

Law Project No 30720-5-0126, Independent Consultant Inspection Cooling Lake Dsm and Ash Pond Dike H. B. Robinson Steam Electric Plant Hartsville, South Carolina", dated December 4, 1995

Law Engineering and Environmental Services Project 30731-6-1801, Report of Concrete Pier Ledge Recommendations CP&L Robinson Plant - Dam Spillway Bridge Hartsville, South Carolina", dated December 2, 1996

"Quarterly System Assessment Report-3rd Quarter 1997, Intake Structure (part of Circulating Water System)", dated October 13, 1997

"Quarterly System Assessment Report - 3rd Quarter 1997, Reservoir System", dated October 23, 1997

"Quarterly System Assessment Report - 4th Quarter 1997, Turbine Building System", dated October 13, 1997

Plant Operating Manual, Volume 6, Part 1, Technical Management Manual (TMM) 040, System and Component Trending Program, Revision 5, dated October 1, 1997

Plant Operating Manual, Volume 1, Part 2, PLP-107, Operating Experience Program, Revision 1, dated October 7, 1997

H. B. Robinson Maintenance Rule Function Failures and Unavailability Trend Data, dated October 15, 1997

H.B. Robinson Maintenance Rule Scoping and Performance Criteria dated October 15, 1997

Maintenance Rule Performance Summaries for the Auxiliary Feedwater System, the Main Steam System, the Emergency Diesel Generators, and the Dedicated Shutdown Diesel Generator

Work Request History Reports for the Main Steam System, the Emergency Diesel Generators, and the Dedicated Shutdown Diesel Generator

Clearance Reports dated October 5, 1997, used to track Unavailability Time for the Main Steam System, the Emergency Diesel Generators, and the Dedicated Shutdown Diesel Generator

Condition Reports 97-01540, 97-01951, 97-02014, 97-02110, 97-02202